

Preliminary Amendment

Applicant: Harry Hedler et al.

Serial No.: Unknown

(Priority Application No. 103 34 577.9)

(International Application No. PCT/DE2004/001360)

Filed: Herewith

(Priority Date 28 July 2003)

(International Filing Date 28 June 2004)

Docket No. I431.146.101/FIN 506 PCT

Title: METHOD FOR APPLYING REWIRING TO A PANEL WHILE COMPENSATING FOR POSITION ERRORS OF SEMICONDUCTOR CHIPS IN COMPONENT POSITIONS OF THE PANEL

IN THE CLAIMS

Please cancel claims 1-6 without prejudice.

Please add new claims 7-29 as follows:

7. (New) A method for applying rewiring to a panel while compensating for position errors of semiconductor chips in component positions of the panel, comprising:
 - providing a panel having component positions having arranged in the component positions semiconductor chips that have position errors; and
 - producing two rewiring masks for compensating for position errors of the semiconductor chips, a first mask having only external contact areas for the entire panel at predetermined positions in the component positions, and a second mask having a uniform rewiring pattern having rewiring lines for an individual component position for connecting contact areas on active upper sides of the semiconductor chips to the external contact areas.
8. (New) The method of claim 7, comprising:
 - transferring the structure of the first mask to the panel with a first exposure in order to prepare for the formation of external contact areas in the component positions.
9. (New) The method of claim 8, comprising:
 - optical position registration and evaluation of the position errors of the semiconductor chips in the component positions of the panel and calculation of the optimal alignment of the second mask.
10. (New) The method of claim 9, comprising:

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adjusting the second mask, while successively compensating for the position errors of the semiconductor chips in the individual component positions of the panel.

11. (New) The method of claim 10, comprising:

wherein adjusting the second mask further includes successively transferring the rewiring pattern of the second mask with a second exposure in order to prepare for the formation of rewiring lines between contact areas on the semiconductor chips and external contact areas in the individual component positions of the panel.

12. (New) The method of claim 1, comprising:

optical position registration and evaluation of the position errors of the semiconductor chips in the component positions of the panel and calculation of the optimal alignment of the second mask.

13. (New) The method of claim 7, comprising:

adjusting the second mask, while successively compensating for the position errors of the semiconductor chips in the individual component positions of the panel.

14. (New) The method of claim 13, comprising:

wherein adjusting the second mask further includes successively transferring the rewiring pattern of the second mask with a second exposure in order to prepare for the formation of rewiring lines between contact areas on the semiconductor chips and external contact areas in the individual component positions of the panel.

15. (New) The method of claim 14, comprising wherein the adjustment and transfer of the structure of the second mask is carried out by means of projection exposure.

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16. (New) The method of claim 14, comprising wherein the transfer of the structure of a mask for the entire panel is carried out by means of contact exposure.

17. (New) The method of claim 14, comprising wherein the laser structuring is carried out successively and individually for each connecting line piece.

18. (New) A method for applying rewiring to a panel while compensating for position errors of semiconductor chips in component positions of the panel, the method comprising:

providing a panel which has component positions arranged in rows and columns, there being arranged in the component positions semiconductor chips whose edges are not aligned accurately in accordance with the rows and columns, so that they have position errors;

producing an overall rewiring mask having external contact areas and rewiring lines approximately as far as edges of the semiconductor chips in the direction of contact areas on active upper sides of the semiconductor chips for the entire panel;

optical position registration and evaluation of the position errors of the semiconductor chips in the component positions of the panel;

transferring the overall rewiring mask to the panels by using a first exposure process in order to prepare for the formation of external contact areas and of rewiring lines approximately as far as the edges of the semiconductor chips in the component positions;

laser-structuring connecting line pieces between the ends of the rewiring lines approximately at the edges of the semiconductor chips and the contact areas on the active upper sides of the semiconductor chips by using a second exposure process by means of a laser write beam.

19. (New) The method of claim 18, comprising wherein the adjustment and transfer of the structure of the second mask is carried out by means of projection exposure.

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20. (New) The method of claim 18, comprising wherein the transfer of the structure of a mask for the entire panel is carried out by means of contact exposure.

21. (New) The method of claim 22, comprising wherein the laser structuring is carried out successively and individually for each connecting line piece.

22. (New) A method for applying rewiring to a panel while compensating for position errors of semiconductor chips in component positions of the panel, the method comprising:

providing a panel which has component positions arranged in rows and columns, there being arranged in the component positions semiconductor chips whose edges are not aligned accurately in accordance with the rows and columns, so that they have position errors;

producing two rewiring masks, a first mask having only external contact areas for the entire panel at predetermined positions in the component positions, and a second mask having a uniform rewiring pattern having rewiring lines for an individual component position for connecting contact areas on active upper sides of the semiconductor chips to the external contact areas;

transferring the structure of the first mask to the panel with a first exposure step in order to prepare for the formation of external contact areas in the component positions;

optical position registration and evaluation of the position errors of the semiconductor chips in the component positions of the panel and calculation of the optimal alignment of the second mask;

adjusting the second mask, while successively compensating for the

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position errors of the semiconductor chips in the individual component positions of the panel and while successively transferring the rewiring pattern of the second mask with a second exposure step in order to prepare for the formation of rewiring lines between contact areas on the semiconductor chips and external contact areas in the individual component positions of the panel.

23. (New) The method of claim 22, comprising wherein the adjustment and transfer of the structure of the second mask is carried out by means of projection exposure.
24. (New) The method of claim 22, comprising wherein the transfer of the structure of a mask for the entire panel is carried out by means of contact exposure.
25. (New) The method of claim 22, comprising wherein the laser structuring is carried out successively and individually for each connecting line piece.
26. (New) A system for applying rewiring to a panel while compensating for position errors of semiconductor chips in component positions of the panel, comprising:
means for providing a panel having component positions arranged in rows and columns, there being arranged in the component positions semiconductor chips whose edges are not aligned accurately in accordance with the rows and the columns, so that they have position errors; and
means for producing two rewiring masks for compensating for position errors of the semiconductor chips, a first mask having only external contact areas for the entire panel at predetermined positions in the component positions, and a second mask having a uniform rewiring pattern having rewiring lines for an individual component position for connecting contact areas on active upper sides of the semiconductor chips to the external contact areas.

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27. (New) The system of claim 26, comprising:

means for transferring the structure of the first mask to the panel with a first exposure in order to prepare for the formation of external contact areas in the component positions.

28. (New) The method of claim 26, comprising:

means for optical position registration and evaluation of the position errors of the semiconductor chips in the component positions of the panel and calculation of the optimal alignment of the second mask.

29. (New) The method of claim 26, comprising:

means for adjusting the second mask, while successively compensating for the position errors of the semiconductor chips in the individual component positions of the panel, wherein adjusting the second mask further includes successively transferring the rewiring pattern of the second mask with a second exposure in order to prepare for the formation of rewiring lines between contact areas on the semiconductor chips and external contact areas in the individual component positions of the panel.